

Serial No. 09/986,458
Amendment dated April 18, 2003
Reply to Office Action of October 21, 2002

IN THE CLAIMS

1. (Currently Amended) An automatic headlight axis direction control system for a vehicle comprising:

a vehicle information detection means for detecting information used for controlling a light axis direction of a headlight of a vehicle;

a control angle calculation means for calculating a light axis control angle ~~to adjust a light axis direction of a headlight on a basis of the detected information;~~

a light axis direction adjustment means for ~~adjusting~~ moving the light axis direction such that the light axis direction of has the headlight on a basis of the calculated light axis control angle;

a direction detection means for ~~detecting~~ outputting a signal having a level correlated to the light axis direction of the headlight; and

a failure detection means for detecting a failure in the light axis direction adjustment means ~~on a basis of the detected light axis direction based upon a predetermined value and the level of the signal that is outputted from the position direction detection means~~ when the light axis direction adjustment means is driven such that the direction detection means outputs the predetermined value unless a failure occurs in the light axis direction adjustment means before the light axis control is started direction starts to be controlled using the light axis direction adjustment means, wherein the failure detection means is operable in response to an engine starting operation.

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2. (Original) The automatic headlight axis direction control system as in claim 1 further comprising:

a failure dealing means for dealing with the failure in the light axis direction adjustment means.

3. (Cancelled)

Amend
4. (Currently Amended) The automatic headlight axis direction control system as in claim 3 1, wherein the failure detection means is operable in response to an engine ignition switch operation.

5. (Currently Amended) The automatic headlight axis direction control system as in ~~any one of~~ claim 1, wherein the failure detection means forcibly drives the light axis direction adjustment means to a predetermined direction irrespective of the calculated light axis control angle and compares the detected light axis direction with the predetermined direction.

6. (Currently Amended) A method of automatically controlling headlight axis direction of a vehicle having a headlight, comprising ~~steps of~~:

determining a failure detection time point which precedes lighting operation of the headlight;

driving the headlight to a predetermined headlight axis direction at the failure detection time point;

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detecting an actual headlight axis direction of the headlight driven by the driving step;
and

detecting a failure of a headlight system before the driving of the headlight begins based upon whether or not when the detected actual headlight axis direction differs from the predetermined headlight axis direction.

7. (Original) The method of automatically controlling headlight axis direction as in claim 6, wherein the determining step starts in timed relation with an engine starting operation.

8. (Original) The method of automatically controlling headlight axis direction as in claim 7, wherein the determining step starts in timed relation with an engine ignition switch operation.

9. (Original) The method of automatically controlling headlight axis direction as in claim 6, wherein the driving step drives the headlight to two limit angles as the predetermined headlight axis direction.

10. (Original) The method of automatically controlling headlight axis direction as in claim 6, further comprising steps of:

detecting vehicle information;

calculating a headlight axis direction variable with the detected vehicle information when a headlight operation is needed and the failure detecting means detects no failure; and

driving the headlight to the calculated headlight axis direction.

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11. (New) The automatic headlight axis direction control system as in claim 1, wherein the direction detection means is a potentiometer and is operatively linked to the light axis direction adjustment means.

12. (New) An electronic control unit for controlling a vehicle headlight axis direction of a vehicle headlight, the electronic control unit comprising:

a control angle calculation means for calculating a light axis control angle to adjust a light axis direction of the vehicle headlight based upon sensor signals received from vehicle sensors;

a light axis direction adjustment means for driving a motor to move the vehicle headlight axis direction in accordance with the light axis control angle; and

a failure detection means for determining if the motor is in a failure state by outputting a predetermined test signal for driving the motor and comparing an output signal subsequently received from a potentiometer electronically coupled to the motor when the motor is driven to the predetermined test signal, and concluding that the motor is in the failure state if the output signal received from the potentiometer is not within a predetermined range associated with the predetermined test signal,

wherein:

the failure detection means activates a failure indication and prevents operation of the motor when the failure state is detected prior to the vehicle headlight axis direction being moved; and

the failure detection means is operable in response to an engine starting operation.

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Amended

13. (New) The electronic control unit as in claim 12, wherein a central processing unit comprises the control angle calculation means, the light axis direction adjustment means and the failure detection means, the central processing unit for executing control programs stored in a memory source.
